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Re: Jacob Tischer (dec'd) v. UPRR  
Date: January 2, 2020

Dear Attorney Hayden,

I have recently reviewed the materials you forwarded me regarding the history of Mr. Jacob Tischer, a conductor for the Union Pacific Railroad [UPRR] Company who developed stroke symptoms in the workplace on August 12, 2017. These medical and legal records are the following:

- On-train video from the locomotive cab [4 avi files] – 08/12/17
- EMS Record, Eau Claire Fire Department – 08/12/17
- Hospital Records from Mayo Clinic Eau Claire (Emergency Department); Mayo Clinic Hospital – Rochester, Saint Mary's Campus; and PM&R Brain Rehab Hospital Service – 08/12-08/26/17
- Autopsy Report – 10/20/17
- MEDIC First Aid – *BasicPlus Version 8.0 Student Book* (© 2018)
- Expert Reports of Emily Duncanson, MD and Steven F. Noran, MD, IMO, LLC
- Depositions of Jessica Tischer, Stephen Marvin, Neil Franchuk, Charles Lux, Michael Swentik, John Thomas, Erik Erikson, Debra Gengler, John Holland, Harold Lowe, Todd Nutter, Michael Linstedt, and Jessica Carson

This report will review Mr. Tischer's medical history from August, 2017. Specifically, I will evaluate the defendant's presenting symptoms of a right-hemispheric stroke in the workplace and the response of his UPRR colleagues, along with his subsequent medical care.

#### Organization

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## I. Background: Early Symptoms

Mr. Tischer was a healthy 31-year-old man who worked as a conductor for UPRR since 2012 [Mrs. Jessica Tischer, Deposition (dep), p. 14]. He was married with 3 young children and lived about one hour outside Eau Claire, Wisconsin [Mayo Clinic records (Mayo), Bates-stamped, p. 88]. His wife formerly worked as a certified nurse's aide and was a full-time homemaker at the time of his stroke.

Mrs. Tischer was deposed and documented some non-specific symptoms on 08/11/2017, the day prior to his work shift. She described him as feeling "tired.. [with] leg cramps" [dep, p. 47] but with no neurological symptoms. Several medical documents identify headache and neck pain as a significant symptom for days-weeks leading up to his stroke "per pt's wife, pt c/o head ache and nausea yesterday" [Eau Claire ED, Mayo, p. 45]; "a bad headache" [EMS Prehospital Care Report, Mayo, p. 26]; "4/10 right-sided neck pain [Admission Note, Neurology Critical Care Hospital Service, Mayo, p. 83]; "He does continue to complain of an occipital headache and some nausea" [Mayo, p. 48]; and "generalized malaise, headache, and gait instability" [Discharge Summary, Neurology Stroke Service; Mayo, p. 292]. The following morning, on 08/12 prior to leaving home for work, Mr. Tischer experienced malaise and nausea, with vomiting: per wife history, he "didn't feel right" and told her that he "felt weird" [dep, p. 68], and reportedly soon collapsed to the ground at home -- an apparent episode of syncope. After that, he was able to communicate and walk normally, such that he was able to report for work that day [dep, pp. 161-162]. Around the time his stroke symptoms began, much later that evening, Mr. Tischer was able to contact his wife by phone about coming home early, but "he wasn't communicating properly" [dep, pp. 95-96], an observation that mirrors contemporaneous reports from his work colleagues [Section II].

### I(a) Observations

The severe headache and neck pain reported by Mr. Tischer are consistent with the working impression in the Medical Records [Discharge Summary; Mayo, p. 292] that his stroke was due to dissection of the right internal carotid artery [ICA]. Cervical artery dissection is the second most common cause of ICA occlusion overall, but would be the most common amongst younger adults, e.g., <40-45 years of age. Dissection of the cervical arteries also generally precipitates localized, ipsilateral facial, head, or neck pain that could be severe, and thus incite a vasovagal response that in turn results in syncope. (Severe pain can also precipitate nausea and vomiting, as was evident that morning at home and again later that day, while in transit at the Altoona depot [Mr. Charles (Chaz) Lux, Interview with Jamie Lukehart, UP Senior Risk Management Representative on 09/29/2017, pp. 7-8]). This explanation for the events occurring during Mr. Tischer's workday is the most tenable one, in particular since no other explanations resulted from his eventual diagnostic testing over the next 12 days while he was an inpatient at Saint Mary's Medical Center, Mayo Clinic [SMMC].

## II. Symptoms at Work

Mr. Tischer's UPRR work shift on 08/12 commenced at 1402 hrs. As conductor, he was working alongside an engineer, Mr. Neil Franchuk, who knew him well. Their task, successfully completed during this initial 5-6 hour trip from Altoona to Norma, Wisconsin that day, was to commute to the latter, bring up empty trains to an empty track and tie them down, put power into a different train loaded with sand, and then return in this second train to the Altoona Depot [Franchuk dep, pp. 16-21]. His colleagues, who either worked the shift with Mr. Tischer (Franchuk, Lux) or who observed him during the interval immediately beforehand -- from 1400-1500 hrs (Mr. John Thomas, Lux), did not identify any concerning symptoms. He acted normally. Mr. Tischer appropriately did his job that afternoon. Mr. Lux, who drove the Professional Transportation, Inc. [PTI] vehicle for transportation assistance and was in the Norma

yard noticed nothing wrong over a period of around 4-5 hours that afternoon, during which Mr. Tischer came into and out of his van several times. Additionally, Mr. Tischer was present during several segments from the video files from the locomotive cab recorded from this shift (1535-1630 hrs and 1630-1730 hrs); these did not identify nor indicate, on my review, any focal neurological signs of stroke.

Mr. Franchuk first became concerned about his partner when Mr. Tischer demonstrated some confusion at the very end of their route (they had returned to Altoona at 1940 hrs). The plaintiff "just looked tired" [dep p. 24], but was not concerned until Mr. Tischer appeared "disoriented. [Upon approaching the Altoona depot, Track 5], he was looking at his (communications) radio, couldn't figure out how to change the channel" [dep p. 26]. Mr. Tischer was, however, able to complete the post-arrival "tie up" of the train by way of setting manually several hand brakes before ultimately arriving at the shanty area. He was later noticed by several other UPRR colleagues (Lux, Thomas, and Mr. Steven Marvin) to have focal left-sided deficits. When Mr. Tischer was walking to and from the portable restroom (at 2025-2030 hrs. per Mr. Thomas), his left leg was visibly dragging: "... he was limping .. out of the portable toilet.. his face was drooping. He was slurring his words.. and he had a water bottle in his hand and he couldn't get the cap off" [Thomas, dep pp. 32-33; Lux, statement, Exhibit No. 1, 07/18/19, Tischer 15]. He also was observed in the PTI vehicle by Mr. Lux, his driver, to not be able to use the left arm to fasten his seatbelt, and on emerging, "his left foot was stuck on the floor" [Lux Interview, p. 9], and he subsequently fell onto the ground exiting the van around 2055 hrs. This moment was the first when Mr. Lux identified that something was clearly wrong with the decedent [Lux Interview, pp. 14-15].

The timeline from abnormal behavior until the onset of overt stroke symptoms ('Last Seen Normal' [LSN] time) was brief. Mr. Thomas [dep, p. 26] reported that the decedent was "acting weird" around 2000 hrs – soon after the return to the Altoona depot, such that he communicated with the manager of yard operations, Mr. Marvin. Mr. Marvin, upon hearing from Mr. Franchuk about his concern for Mr. Tischer, immediately drove from his office elsewhere in the Altoona yard to directly evaluate Mr. Tischer, and soon after arrival, communicated with his boss, Mr. Michael Swentik, the senior Manager of Terminal Operations [Marvin dep, p. 26]. Stroke symptoms, per Mr. Thomas (but not observed by anyone else on scene), with left face and/or limb paresis, commenced thereafter, around 2020-2030 hrs. Finally, a few minutes after Mr. Tischer fell outside the PTI vehicle, Mr. Marvin alerted '911' to send for an ambulance, at 2056 hrs. Mr. Swentik, who had oversight (but was not present at the Altoona yard), was also contacted by Mr. Franchuk about this acute illness, at 2055 hours [Franchuk, dep, p. 98]. Mr. Swentik similarly reported to his supervisor, Erik Erickson, Director of the Transportation Service for UPRR, that evening [dep, p. 17]. The Eau Claire Fire Department EMS was on the scene first evaluating Mr. Tischer rapidly, at 2107 hrs. The left-sided deficits identified by the UPRR colleagues were soon verified by an EMS worker, Michael Linstedt [Mayo, p. 26].

## II(a) Observations

The staff members acknowledged having little personal experience or medical training in evaluating patients with acute stroke, yet several – in particular, Franchuk, , and Thomas – all responded rapidly and approached Mr. Marvin about relieving Mr. Tischer of his duties that evening, and Mr. Marvin acted expeditiously to do just that. At deposition, Ms. Debra Gengler, the Director of Clinical Services for UPRR, affirmed that there was no formal training in stroke awareness – i.e., signs and symptoms – for acute stroke offered to its employees, given that its workplace incidence is "extremely low" [dep, p. 12]. Rather, employees are expected to signal '911' for medical emergencies when a colleague becomes unable to care for themselves or experiences sudden incapacitation [Gengler dep. pp.12-13; and Holland deposition], as Mr. Marvin had done in this case.

Mr. Tischer's left-sided deficits, first observed (by Mr. Thomas only) no earlier than 2020, and later by Mr. Lux and Mr. Marvin, were clear evidence of a right hemispheric stroke syndrome. They are very common in patients with occlusion of the right middle cerebral artery [MCA]. Language may also be

impaired from the standpoint of motor impairment – i.e., ‘dysarthria’ or slurred speech, though (given language is typically a left-hemispheric function) stroke patients are able initially to coherently provide a medical history, as the plaintiff could for EMS providers [Mayo, p. 26; Marvin, dep. p. 35].

In my review, the timeline from calling ‘911’ EMS from unequivocal ‘LSN’ – the onset of left-sided neurological impairment – until arrival at the Eau Claire ED was only around one hour in total: i.e., from around 2020 hrs in the field to 2124 hrs arrival at this local hospital. This timeframe is very encouraging in terms of the timeliness required for stroke patient in-field processing. Mr. Tischer’s potential to receive emergent therapy for acute ischemic stroke was not compromised by his small amount of time in the workplace, but rather was consistent with the vigilance of multiple on-site UPRR observers. This timeliness readily allowed for the decedent to be adequately screened for both medical and procedural approaches to treat his acute ischemic stroke and would not have altered his eventual stroke outcome [See Section III(a)]. To my review, the interval from left-sided impairments (that were certainly due to right hemispheric ischemia) to their recognition and notification of EMS by the UPRR staff members was probably on the order of several minutes, i.e.,  $\leq$ 5-30 minutes. Mr. Swentik also concluded that the on-site UPRR employees working with Mr. Tischer all had responded appropriately to his symptoms [dep., p. 74]. The chain of command, in terms of supervisors (Marvin, Swentik, Erickson) communicating to one another that evening, also was appropriate.

### III. Stroke Management, Mayo Clinic: Eau Claire & Saint Mary’s Hospitals

Mr. Tischer was then transported to the nearby Eau Claire, Mayo Clinic, medical campus, arriving at 2124 hrs that evening. The nursing note by Melissa Thomas, RN [Mayo, p. 3; pp. 38-39] reported no clear history (that the plaintiff could provide, and none was apparently taken from any of the eyewitnesses), with the onset of left hemiparesis estimated at 2030 hours, as well as nausea and headache. One early measure of stroke severity was an NIH Stroke Scale score [NIHSS] of 12 points at 2232 hours [Mayo, p. 38]. The patient’s neurologic examination demonstrated dysarthria, left facial paresis and left hemiparesis. The hemiparesis “became maximum at 20:45 today”, per the ER provider, Jimmy Fulgham, MD [Mayo, p. 39]. Mr. Tischer was treated with ondansetron, an anti-emetic medication, and IV normal saline [Mayo, p. 38].

The head CT scan [HCT] at 2142 hours [Mayo, pp. 16-18] demonstrated early right MCA infarction in the subcortical right frontal and temporal lobes. The CT angiography [CTA] showed occlusion (lack of contrast) in both the right ICA and its main intracranial branch, the right MCA [Mayo, p. 18], as documented by Dr. Fulgham in his intake note.

The Telestroke (telemedicine) Service from the tertiary care medical center, SMMC, had been consulted and advised that the patient be transferred and also that he not receive IV t-PA [Mayo, p. 38]. In her role as the “on call MD” of the Telestroke Service, Jennifer Seibel, MD had a conference call at 2155 hrs, with Dr. Fulgham: “Images review, however unable to connect via computer. Pt will come to ED [at SMMC] for further evaluation. ED EVAL: Neuro Evaluation” [M Thomas, RN note, Mayo, p. 38]. At 2232 hrs, a nursing report was received from Eau Claire by SMMC, and Mr. Tischer was transported to SMMC by the Mayo I flight crew [Mayo, p. 48], arriving at 2304 hrs [Mayo, p. 40]. The NIHSS was now 16 points: the patient “had become somnolent.. [and] arousable” but his mental status did not enable history-taking [Craig Tschautscher, MD; Mayo, pp. 44-45].

Upon arrival at SMMC, the emergent CT perfusion scan at 2358 hrs suggested an area of right hemisphere that was ischemic yet could still benefit from reperfusion. This study “showed a moderate-to-large size core infarct [stroke] involving the right MCA territory as well as a small-to-moderate sized surrounding penumbra” along the anterior and posterior aspects of the core infarct [Mayo, p. 69, 292, 472]. A decision was made for catheter-based intervention, known as endovascular therapy [EVT]. A

proximal-to-distal recanalization from the right ICA, proceeding up into the MCA, using various clot retrieval devices [Mayo, 75-76, 479-80], was successful in opening up both arterial occlusions, with a "large amount of thrombus" (clot) removed. This procedure was subsequently reported afterwards by the interventional physician, Giuseppe Lanzino, MD, at 0206 hrs on 08/18. The final NIHSS before leaving the angiography suite was again 16 points.

Other findings during the hospitalization were commonplace for patients with proximal MCA occlusion who do not substantially benefit from EVT. They included the following: neurocritical care unit observation and management; somnolence due to the evolution of significant hemispheric edema, despite medical efforts (IV mannitol) to manage this edema; a right hemicraniectomy (08/14) to prevent brain death due to cerebral herniation; a decision, given the severity of hemorrhagic transformation, to not pursue systemic anticoagulation; immobilization associated with bilateral lower-extremity deep-vein thrombosis [LL DVT], and the development of pulmonary thromboembolism [PE], managed with subsequent placement of a filter into the inferior vena cava [IVC] (08/21); analgesic use for headache and neck pain; and evaluations for physical, occupational, and speech therapy, with transfer to an inpatient rehabilitation facility (08/24) [Mayo, pp. 292-8].

### III(a) Observations

Why was Mr. Tischer not treated with intravenous thrombolysis [IV t-PA] at the Eau Claire ED? (Patients with acute ischemic stroke may be treated, if no contraindications, with IV t-PA, within 4.5 hours from LSN.) First, the clinicians there were appropriately – per the medical record – responding to input from their Saint Mary's colleagues via the Telestroke Service. The medical record indicates uncertainty about the LSN time as the leading reason [Mayo, p. 292], and unfortunately, the ED providers at Eau Claire did not directly document having interviewed any of the UPRR employees who were on site that evening. Additionally, though, Drs. Seibel and Fulgham identified not only occlusion of the right ICA and MCA, tandem lesions on the CTA that would not typically recanalize with IV t-PA alone, without EVT (due to their great clot burden), but also, critically, early infarction (hypodensity) present on the initial non-contrast HCT scan in the right MCA territory. This early infarct on HCT is an absolute contraindication for the administration of IV t-PA. The decision by Dr. Seibel to instead emergently transfer Mr. Tischer for St. Mary's, where EVT would be considered, was the correct course of medical management.

### **IV. Venous Thromboembolism and Acute Respiratory Failure**

On the morning of August 26, two days after entering into the Rehabilitation Mr. Tischer was being pushed around in a wheelchair on his unit by his wife. Unfortunately, as he was being transferred by nursing and PAC staff back into his bed at 1015 hrs, he started to rapidly desaturate, with oxygen saturation levels of 65-75%. He was given a non-rebreather bag, and a "code 45" was called at 1030 hrs. He was intubated for acute-onset respiratory distress but deteriorated into bradycardia and then a PEA arrest from which he could not be resuscitated. During the code, due to the overwhelming concern for a massive PE, IV t-PA was initiated after its approval by the neurosurgical service. With no return of spontaneous circulation, after 25 minutes, CPR was discontinued. The time of death was 1111 hrs.

An Autopsy was undertaken one week later, on 09/01/17 by Peter T. Lin, MD and Erica M. Reed, PA. The immediate cause of death was systemic and pulmonary arterial thromboembolic disease: acute PE within the main pulmonary artery and extending into the left main pulmonary artery was the primary finding. Other relevant findings were several rib fractures (caused by prolonged CPR), LL-DVT's, and the neuropathology due to the recent right MCA infarction and hemicraniectomy [Tischer 3].

**IV(a) Observations**

Mr. Tischer had already experienced bilateral DVT's and associated subsegmental PE's. He then had an elective placement of an IVC filter, as his clinicians in neurology and neurosurgery felt that the risk of systemic anticoagulation was too high. The concern was that, given his recent craniotomy and hemorrhagic transformation within the right-hemispheric ischemic infarction, being administered an anticoagulant, such as a heparinoid (e.g., enoxaparin), would hold too great a risk for precipitating further life-threatening intracranial hemorrhage and additionally associated hemispheric mass effect. Thus, the alternative state -- being prothrombotic from his immobilized, hemiplegia state -- was understandably very high.

Sidenote: The autopsy correctly identified the cause of death to be massive PE. The mechanism for stroke suggested by the pathologist was one of "paradoxical embolism" [Autopsy, p. 1; Tischer 8] -- i.e., from thromboembolism to the lungs originating from LL-DVT and then entering the arterial circulation directly via a patent foramen ovale, a normal variant of cardiac anatomy. This stroke mechanism was, however, incorrect. Though the pathologist provides extensive documentation for atherosclerosis and organized thrombus within multiple lower-extremity veins [Tischer 12], their report surprisingly indicated that the "right carotid [was] not available for examination" [Tischer 8]. However, careful examination of the right ICA (though mechanical clot retrieval in the EVT procedure had reopened this vessel) may have shown evidence of the actual stroke etiology, dissection of this artery [Section I].

**V. Conclusions**

Mr. Tischer developed a severe right-hemispheric stroke syndrome around the time of the end of his shift -- of onset around 2000-2030 hrs, soon after he returned to the Altoona depot from his first work assignment of that day in Norma. The earlier headache, neck pain, and nausea and vomiting were more probable than not due to the right ICA dissection seen on his neurovascular imaging studies, specifically the CTA and conventional angiography. There was also speculation as to whether some of Mr. Tischer's earlier symptoms, such as mild confusion and erratic behavior -- as reported in the depositions from workplace colleagues (Franchuk, Lux, Thomas, Marvin, and Lowe), as to whether these signified the start of his acute stroke syndrome but, of note, their duration was quite brief (e.g., 10-20 minutes) prior to the development of left-sided neurological impairments that clearly indicated the onset of right hemispheric ischemia [Section II]. On the contrary, I found that Mr. Tischer's stroke syndrome was expeditiously recognized by the UPRR staff, and his arrival time to the Eau Claire ED offered him the potential to receive medical and endovascular treatments. On my review, this duration in the field would not likely have affected the overall outcome of stroke. The limiting step that prevented the decedent from receiving IV t-PA was frankly the rapid early progression of his stroke due to carotid dissection; early changes of cytotoxic edema within the right hemisphere (hypodensity) were identified on the initial HCT [Section III].

As reviewed above, the plaintiff's access to emergent medical care via '911', as organized by various UPRR employees, was both responsible and appropriate [Section II]. The plaintiff went on to SMMC to receive neurocritical care and an EVT procedure in order to reopen his occluded cervical and intracranial arteries [Section III]. He then required an aggressive intervention, a right hemicraniectomy, in order to prevent severe cerebral herniation. Mr. Tischer's stroke was a very unfortunate, life-threatening event. His death from a massive PE was caused by venous thromboembolism due to LL-DVT, that had in turn resulted from severe post-stroke hemiplegia.

My opinions, based upon my education, training, and experience, are based upon my review of the above medical records and are held within a reasonable degree of medical certainty. I reserve the right to

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supplement this written statement and/or amend my opinions as appropriate, should additional information or opinions become available.

Thank you for your attention to this Report.

Sincerely,



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/mac